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EXAMINER

TILL, TERRENCE R

ART UNIT	PAPER NUMBER
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1744

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Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/648,575
Filing Date: August 26, 2003
Appellant(s): LECLEAR ET AL.

MAILED
NOV 30 2006
GROUP 1700

Mark A. Davis
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/4/06 appealing from the Office action mailed 6/14/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

FR 2 689 474	Laurent	10-1993
DE 299 21 025	Schollmayer	2-2000
6,817,058	Harrelson	11-2004

Translation of FR 2 689 474

Translation of DE 299 21 025

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(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over French patent to Laurent '474 in view of German patent to Schollmayer '025.

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The patent to Laurent discloses (figs. 5-11) vacuum system for a vehicle comprising: a hose storage module 17 having a storage space and adapted to house a retractable vacuum hose 7 on a storage reel; a vacuum canister 18 fluidly connected to an end of the vacuum hose. Laurent does not disclose a vacuum console that has a pivotal and slidable cover in the shape of a vehicle seat. The German patent Schollmayer discloses a vacuum console 9 adapted to house a vacuum nozzle and having a pivotal and slidable cover (back of seat folded down- see figure 2) in the shape of a vehicle seat (the seat back). The hose storage module being positioned within the vehicle and configured to allow the retractable hose to reach any portion of the interior space of the vehicle. Schollmayer also discloses (see English abstract) that it is a battery operated cleaner. It would have been obvious to a person skilled in the art at the time the invention was made to provide Laurent with a console in view of the teaching of Schollmayer in order to be able to access the hose as well as hide it when not in use. Further, It would have been obvious to a person skilled in the art at the time the invention was made to provide Laurent with a battery in view of the teaching of Schollmayer so as to provide a power source for the vacuum motor. With respect to the recitation that it is a rechargeable deep draw battery, Schollmayer does not say what kind of battery it is. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a rechargeable deep draw battery, since it is considered to be within the general skill of a worker in the art to select a rechargeable battery on the basis of its suitability for the intended use as a matter of obvious engineering choice.

Claims 4 and 7-9, stand rejected under 35 U.S.C. 103(a) as being unpatentable over French patent to Laurent '474, as modified by German patent to Schollmayer '025, as applied to claim 1 above, and further in view of Harrelson '058.

Laurent '474, as modified by Schollmayer '025, does not disclose the nozzle comprising a handle portion and a suction portion, the handle portion being configured with a first switch being electrically connected to a vacuum motor to operate the vacuum and a second switch being electrically connected to the hose storage module to operate a motorized extension and retraction of the hose. The patent to Harrelson discloses a vacuum system comprising: a hose storage module 17 adapted to house a retractable vacuum hose having a first end and a second end; a handle portion 38 and a suction portion 44, the handle portion being configured with a first switch 112 being electrically connected to a vacuum motor to operate the vacuum and a second switch 110 being electrically connected to the hose storage module to operate a motorized extension and retraction of the hose. The electrical connections are made by electrical wiring that runs along the hose and is connected to a wiring module. It would have been obvious to a person skilled in the art at the time the invention was made to provide Laurent, as modified by Schollmayer, a handle portion being configured with a first switch being electrically connected to a vacuum motor to operate the vacuum and a second switch being electrically connected to the hose storage module in view of the teaching of Harrelson in order to automate the vacuum operation as well as eliminate any mechanical failure of spring-wound hose reel.

(10) Response to Argument

First, the examiner would like to point out that, in section "B" of appellant's arguments, appellant's representative recites that claims 1-3 and 5 are obvious in view of the asserted combination of Laurent, Schollmayer and Harrelson. In actuality, it is claims 4 and 7-9 that are rejected over the three references mentioned. It is believed that the appellant's representative made a typographical error as the appellant's representative correctly identified the grounds of

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rejection above. For the purposes of the Examiner's Answer, The arguments in section "B" of appellant's arguments will be considered to correspond to claim 4 and 7-9.

Claims 1-3 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over French patent to Laurent '474 in view of German patent to Schollmayer '025.

With respect to appellant's arguments defining the legal basis for the law governing an obviousness rejection recited in section "A", appellant argues the examiner's conclusion of obviousness is based upon improper hindsight reasoning ("hindsight syndrome" quote in page 5, paragraph 2), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Further, appellant argues (page 5, paragraph 3) that "there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the appellant". The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one skilled in the art, after seeing the patent to Laurent, would realize that the nozzle 8 (Laurent calls it a "suction end piece") projects into the cabin of the vehicle becoming a hindrance to ingress and egress of the vehicle (see figures 14 and 15) as well as the

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nozzle/hose assembly possibly getting damaged by the driver or passengers. What Schollmayer teaches is the concept of hiding/storing the vacuum cleaner, and all its components, in and behind a seat, or console, to keep it out of the way when not in use. In the motivation for making the obviousness rejection of Laurent in view of Schollmayer, the examiner recognizes that there is an implicit showing that one skilled in the art would recognize the disadvantage of the nozzle projecting forth from the housing. Figure 15 even shows the vacuum assembly located underneath a seat.

With respect to appellant's argument (page 8, paragraph 3) that the patent to Schollmayer teaches away from Laurent as Schollmayer needs to be assembled before use, the examiner respectfully points out that it is the teachings of hiding the vacuum behind a console (9 of Schollmayer) that would suggest to one skilled in the art motivation to modify the device of Laurent such that the console houses the nozzle portion of the vacuum. It is recognized that Schollmayer has a different mode of operation; but the examiner is only relying on Schollmayer to demonstrate that one skilled in the art would want to hide/store the vacuum cleaner, and its components, when not in use.

With respect to appellant's contention (page 9) that the combination of Laurent in view of Schollmayer changes the principle of operation, the examiner respectfully disagrees. As appellant points out in *In re Ratti*, "[t]his suggested combination of references would require a substantial reconstruction or redesign of the elements shown in [the primary reference] as well as a change in the basic principles under which the [primary reference] construction was designed to operate". No reconstruction of Laurent by the examiner, in view of Schollmayer, has been done. As the motivational statement by the examiner makes clear "[i]t would have been obvious

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to a person skilled in the art at the time the invention was made to provide Laurent with a console in view of the teaching of Schollmayer in order to be able to access the hose as well as hide it when not in use". The construction and operation of Laurent stays the same.

With respect to appellant's argument (page 10, first paragraph) that Schollmayer does not have a "console", and thus, does not store anything, it is pointed out that Schollmayer's seat/arm rest provides access to the vacuum cleaner mounted behind the seat. This, coupled with the teaching of Laurent, particularly figure 15 of Laurent, would suggest to one skilled in the art to employ part of the seat/armrest, as shown in Schollmayer, to act as a point of access for the device of Laurent, as shown in Figure 15. This is stated in the motivational statement of the rejection as quoted above.

With respect to appellant's assertion (page 10, paragraph 3) that the combination of Laurent and Schollmayer does not teach appellant's combination, appellant imposes their own view of what the examiner's grounds of rejection were. Appellant states (page 10, last two lines to page 11, line 3) "[i]f the vacuum cleaner of Schollmayer were combined with the vacuum cleaning unit of Laurent, as suggested in the Office Action, the combination would result in mounting the vacuum cleaning unit of Laurent behind the seat of the vehicle, as taught by Schollmayer, with the externally accessible nozzle of Laurent or a remotely stored nozzle of Schollmayer". Appellants view of the teachings of the prior art are not consistent with the grounds of rejection as no where in the body of the rejection is any such thing mentioned. See the motivational statement quoted two paragraphs above.

With respect to appellant's arguments (page 11) that neither reference teaches a console that houses a vacuum nozzle, the resulting combination would not teach a console housing the

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vacuum nozzle, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; **nor is it that the claimed invention must be expressly suggested in any one or all of the references** (emphasis-examiner). Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). One of ordinary skill in the art practicing the invention of Laurent would readily recognize providing the console panel in such a way to house the nozzle in order to hide the nozzle from view during consumer use of the vehicle for both aesthetic and safety reasons. Schollmeyer further shows an example in the art where the console in the vehicle conceals all the vacuum parts.

Finally, with respect to the rejection of claims 1-3 and 5, It should be noted that in figures 1, 2, 6, 7, 10 and 15, Laurent does disclose a housing 1, 16, 38 and 10, respective to the figures, that could be considered a vacuum console adapted to house a nozzle (8,8a), or a portion thereof. Claim 1 only requires that the console is “adapted to house a vacuum nozzle”.

Claims 4 and 7-9, stand rejected under 35 U.S.C. 103(a) as being unpatentable over French patent to Laurent ‘474, as modified by German patent to Schollmayer ‘025, as applied to claim 1 above, and further in view of Harrelson ‘058.

With respect to appellant’s arguments regarding the rejection of claims 4 and 7-9 over Laurent, Schollmayer and Harrelson, appellant argues (page 12, last paragraph) that there is no suggestion to combine Harrelson with the underlying combination as asserted in the Office action. The examiner disagrees as Laurent discloses a hose reel that will retract due to a spring 9 coupled to the hose storage module. Harrelson discloses a hose storage module 17 that is coupled

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to an electric motor 88. The handle of Harrelson has switches 110,112 to operate the motor to retract or extend the hose. As the motivational statement clearly says, one skilled in the art would recognize that you would use the electrically operated extension/retraction mechanism of Harrelson "in order to automate the vacuum operation as well as eliminate any mechanical failure of spring-wound hose reel". Again, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, supra.

Appellant reiterates (page 14) that the combination of Laurent and Schollmayer would result in mounting the vacuum cleaning unit of Laurent behind the seat of a vehicle, as taught by Schollmayer, with the externally accessible nozzle of Laurent or a remotely stored nozzle of Schollmayer. As stated above, this is appellant's viewpoint of what the prior art teaches; not the examiner's viewpoint, or the grounds of rejection the examiner employed.

(11) Related Proceeding(s) Appendix

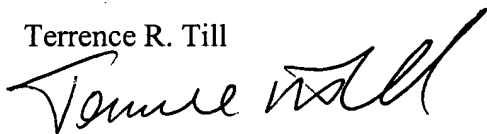
No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

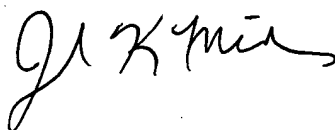
Respectfully submitted,

Terrence R. Till

A handwritten signature in black ink, appearing to read "Terrence R. Till". The signature is fluid and cursive, with the first name being more prominent.

Conferees:

Jennifer Kolb-Michener

A handwritten signature in black ink, appearing to read "Jennifer Kolb-Michener". The signature is cursive and somewhat stylized.

Gladys P. Corcoran

A handwritten signature in black ink, appearing to read "Gladys P. Corcoran". The signature is cursive and somewhat stylized.

PTO 07-587

French Patent No: 2 689 474

WASTE VACUUM CLEANING INSTALLATION PARTICULARLY FOR AUTOMOBILES

Robert Laurent

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. NOVEMBER 2006
TRANSLATED BY THE MCELROY TRANSLATION COMPANY

Attach

REPUBLIC OF FRANCE
National Institute of Industrial Property
FRENCH PATENT NO. 2 689 474

International Classification ⁶ :	B 60 S 1/64
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Date of Public access to the Application:	October 8, 1993, Bulletin 93/40

WASTE VACUUM CLEANING INSTALLATION PARTICULARLY FOR AUTOMOBILES

[Centrale d'aspiration de déchets notamment pour véhicules automobiles]

Inventor:	Robert Laurent
Applicant:	Robert Laurent - France

List of documents mentioned in the search report: Refer to the end of this section.

The object of the invention is connected with the technical sector of vacuum cleaner devices particularly for dust, plant matter, food scraps and small objects normally deposited on automobile floors and seats by the occupants. /1*

Currently available for cleaning the interior of vehicles are conventional vacuum cleaning means of the household or industrial vacuum cleaner type or small portable vacuum cleaners with reserve power or connected to the battery or cigarette lighter of the vehicle.

The household vacuum cleaners are powerful enough to fulfill their role, but they are not very manageable, and their different end pieces are not suitable for removing the soiling matter in the smallest recesses of an automobile, heavy truck, train or airplane interior... Furthermore, they require an electrical connection which is not always situated in the vicinity, hence the use of electrical extensions for connecting a power outlet of one's apartment to the power cord of the vacuum cleaner (with the vehicle situated as close as possible to the building).

* [Numbers in the margin indicate pagination of the original foreign language text.]

The industrial vacuum cleaners, certain ones of which are offered in specialized stations, although quite suitable, require particular steps on the part of the motorist, hence a loss of time, and they are generally subjected to a payment with a limited duration in time.

The independent portable vacuum cleaners or those connected to a power source of the vehicle are not very effective and also are incapable of picking up the waste at all points of the vehicle.

Therefore, in order to solve this specific problem of vacuuming waste in a vehicle, the vacuum cleaning installation according to the invention was designed, installation which can be arranged for being integrated in the passenger space during the construction of the vehicle or offered as an accessory and arranged in a suitable place in the interior, for example, under the dash board, under the seat, against the central console, against a wall, a door, or even in the trunk. /2

The original design of this vacuum cleaning installation and its easy adaptability in the vehicle make it possible for the motorist always to have within reach an effective, precise and discrete vacuum cleaning means which should incite him to use it very frequently, for example, in a traffic jam, at a very long red light, during a limited stop, at the end of a trip, parked or in his own garage, and therefore in this way to have an interior which is always clean and wholesome.

The vacuum cleaning installation responding to the problem which is posed is characterized by the fact that it essentially has an electric motor equipped for creating a depression in a waste vacuum cleaning circuit which is composed of a flexible hose with a suction end piece, wound on a rotary drum; said hose communicating in a sealed manner, through a central space of the drum and at least one hole or passage, with a removable waste receiving tank capable of holding in the waste, with only the air sucked in by the motor emerging to the open air.

According to other characteristics, the flexible vacuum hose wound around a rotary drum has in its thickness a metallic reinforcement keeping it from being crushed during operations; whereas its periphery has regularly spaced rough parts of the groove type in order to cooperate with a retractable non-return device when it is unwound from the drum. /3

Another characteristic lies in the fact that the removable waste receiving drawer and the drum for winding of the flexible hose, along with all the necessary sealing means, are housed in a box which also has the hole or holes or passage for communication between the central space of the drum and the tank.

According to other characteristics proceeding from the preceding one, the electric motor creating the depression is housed entirely or partially in the box, or else is arranged independently from the box and connected to the tank by an appropriate duct.

According to another characteristic proceeding from the preferred use of the installation, the rotary drum, the removable drawer and the box are established in different shapes and sizes depending on the method of attachment of the box in the vehicle.

According to other characteristics proceeding from the preceding one, the box has any type of means for attachment, catching or clipping with a vertical, horizontal or inclined support of the vehicle, or else it is integrated in an existing outfit inside the vehicle.

These characteristics and still others will emerge from the following description:

In order to clarify the invention but without limiting it, in the appended drawings:

- Figure 1 is a view in section illustrating the vacuum cleaning installation according to one form of execution which is to be placed vertically in the vehicle.

- Figure 2 is a top view corresponding to Figure 1.

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- Figure 3 is a view in section considered according to line 3-3 of Figure 1.

- Figure 4 is a top view in section considered according to line 4-4 of Figure 3.

- Figure 5 is a view in section illustrating the vacuum cleaning installation according to an embodiment which is to be placed horizontally or in an inclined manner in the vehicle.

- Figure 6 is a top view in section considered according to line 6-6 of Figure 5.

- Figure 7 is a bottom view in section considered according to line 7-7 of Figure 5.

- Figure 8 is a view in cross section considered according to line 8-8 of Figure 6.

- Figure 9 is a view in section illustrating the vacuum cleaning installation according to an extra-flat form of execution which is to be placed vertically or in an inclined manner in the vehicle and whose electric motor is independent.

- Figure 10 is a view in section considered according to line 10-10 of Figure 9.

- Figure 11 is a view in section considered according to line 11-11 of Figure 9.

- Figure 12 is a view showing the configuration of one of the suction end pieces equipping the end of the flexible hose.

- Figures 13, 14 and 15 diagrammatically show different arrangements of the installation in the vehicle.

In order to make the object of the invention more concrete, it is now described in the form of non-limiting forms of execution illustrated in the figures of the drawings.

The execution illustrated in Figures 1 to 4 applies either to an independent and portable vacuum cleaning installation or to an installation integrated in the construction of the vehicle and attached vertically inside of the vehicle, for example, at the site of the central console.

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This installation designated overall by (C1) is composed of box (1) attached on base (2) for resting on the floor or for attachment on a horizontal support. Said base is open on one side (2a) for receiving removable tank (3) by sliding and in a sealed manner, drawer whose upper surface is limited to upper strip (3a) leaving on both sides opening (3b) for passage of vacuumed

waste (Figure 4) which has passed through holes (2b) of the upper surface of attachment of the box. Said holes are executed outside of hollow central sleeve (2c) used for guiding the rotation of rotary drum (4) extending to the top of the box and whose widened lower part forms chamber (4a) for circulation of air and waste communicating with the drawer through holes (2b). Flexible sealing means (5) are arranged, on one hand, between sleeve (2c) and the drum, and on the other hand, between the lower surface of the widened part of the drum and the upper surface of base (2).

Drum (4) is mounted so as to rotate at the upper part of the box on shaft (6), and all along its height starting from the widened part, it has helical projection (4b) intended for the correct winding of flexible waste vacuum hose (7) equipped at its end coming out of the box with interchangeable suction end pieces (8) with conical contact (8a) in conical bore (1a) of the box. It should be noted that, importantly, the pitch of the helix is calculated so that its sides are tangential with the hose outlet axis. /6

In order to ensure the automatic winding of hose (7) when not in use, elastic return means (9) is provided, inserted between the upper surfaces of the box and of the drum. Furthermore, in order to automatically lock the flexible hose in the out position, automatic locking device (10) is provided immediately behind the end piece, device which consists, for example, of push button (10a) connected to interiorly profiled ring (10b) for allowing the flexible hose to run in the out direction under the effect of return spring (10c) and for locking said hose in the direction of re-entering by wedging of ring (10b) between two consecutive projections of groove (7a) type with which the hose is equipped externally over its whole length.

It should also be noted that hose (7) has in its thickness a metallic reinforcement which is not represented, preventing it from being crushed during operations.

At the opposite end from the end piece, flexible hose (7) is attached to the widened part of drum (4) so as to put it in communication with interior chamber (4a) of said drum. Also provided in order to ensure correct winding is at least one guide roller (11) arranged vertically inside of box (1).

Electric motor (12) equipped for creating a depression is attached at the top of sleeve (2C) which for this purpose has axial opening (2C1), and it can either be entirely housed in interior space (4c) of the drum or stick out past the drum or even the box.

It is thus understood that during actuation of the motor, which can be connected to a power source of the vehicle (cigarette lighter, independent outlet from the battery...) or else can have stored power, the air and waste sucked in from the outside run through unwound flexible hose (7), interior chamber (4a) of the drum, holes (2b) of base (2) and receiving tank (3). In return, only air can go back to the motor through the interior of sleeve (2c) thanks to interchangeable filter (13) arranged in central strip (3a) of the drawer. /7

The air sucked in through the motor emerges to the outside either directly if the motor sticks out past the box or indirectly through openings of the drum and/or the box.

It should be noted furthermore that if the installation as described is of the independent and portable type, the box is then equipped with transport handle or belt (14) (Figure 14).

Finally, as illustrated in Figure 12, at least one of end pieces (8) (the one used most often) has mouth 58b) [sic; (8b)] which is ovoid in shape with brush (8c) placed in the longitudinal axis on central partition (8d) connected to the periphery by transverse braces (8e).

According to the second embodiment illustrated in Figures 5 to 8, installation (C2) is of the type which is either integrated in the construction of the vehicle and attached on or under a horizontal or inclined plane, for example, at the site of the central console, or is sold as an accessory to be attached horizontally, vertically or in an inclined manner against a vertical plane (Figure 13), under the dash board (Figure 14) or under a seat (Figure 15) still in the spirit of being quickly operational.

Found again as in the preceding execution is flexible hose (7) with interchangeable end pieces (8), with its device for locking (10) the hose in the out position and for automatic winding (9); the same references are therefore used again for the rest of the description and will not be described in more detail. /8

With regard to the design of the installation, one also finds the same principles again but combined in such a way as to give it an extra-flat general shape so that it can be housed easily in the passenger space without being in the way of the passengers.

For this purpose, it has base plate (15), and box (16) attached underneath, intended for enclosing drum (17) for winding the hose flat and removable waste receiving tank (18).

Drum (17) turns on shaft (19) connected with the plate and equipped with return device (9). Flexible hose (7) opens into central cavity (17a) of the drum, while end piece (8) with conical bearing surface (8a) is supported in conical housing (16a) of the box, equipped with locking device (10).

Most of electric motor (20) is preferably embedded in central cavity (17a) of the drum and attached under box (16). Flexible seal (21) is inserted between the lower surface of the drum and intermediate partition (22) of the box, delimiting space (e) which, as illustrated in Figure 7, is separated in two roughly orthogonal directions by vertical walls (23-24) starting from the central cavity and ending near the lateral sides of the box in the vicinity of transverse partition (25) separating the housing of the drum from that of the drawer. Walls (23-24), along with intermediate partition (22), thus form chutes. /9

Between vertical walls (23), the intermediate partition has opening (22a) for communication with central cavity (17a) of the drum, and on the opposite side, another opening

(22b) opening into space (e1) delimited by transverse partition (25), a lateral side of the box and curved partition (26) around the drum (Figure 6).

Between vertical walls (24) forming chutes, the intermediate partition also has opening (22c) similar to opening (22b) and opening into space (e2) of the same nature as space (e1).

At the site of these spaces (e1-e2), transverse partition (25) has set-backs (25a-25b) for communication with waste tank (18) whose facing wall (18a) forms corresponding indentations (18b-18c); set-back (25a) receives interchangeable filter (27).

It should be noted that the configuration of the indentations of tank (18) allows it to be placed in its housing in two orthogonal positions depending on whether the installation is attached vertically or horizontally.

According to this construction, it is seen that during actuation of electric motor (20), the air and waste sucked in through the suction end piece run into flexible hose (7) from which they flow at (17b) into the central cavity, in the vicinity of opening (22a) of the partition, pass through chute (32) in order to fall in space (e1), running through opening (22b), and then penetrate into tank (18). Filter (27) on the opposite side retains the waste, and the returning air passes through indentation (18b) and set-back (25a) and then into space (e2), chute (24) before entering through opening (28a) made in casing (28) of the motor and exiting to the open air under the box. Of course, seal (29) is preferably inserted between chutes (23-24) and the interior surface of the box.

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According to the third form of execution illustrated in Figures 9, 10 and 11, the installation is also of the extra-flat type for being attached vertically with a minimal space requirement in the passenger space of the vehicle, but in this case, so as to make it possible to further reduce the thickness of the installation, electric motor (30) for creating a depression is independent from the box and can thus be housed in site out of the way such as in the engine compartment.

The motor is connected to box (38) by flexible duct (31) opening at the bottom of waste drawer (32), whose interchangeable filter (33) is attached on inclined bottom wall (32a).

The air and waste sucked in as in the preceding run into flexible hose (7) through the suction end piece and then into central cavity (34a) of winding drum (34) and rejoin the tank through sealed chute (36) arranged between intermediate partition (36) and attachment surface (37) of box (38), running into space (e3) delimited by the box and curved partition (39) surrounding drum (34).

Found again, of course, are device (10) for locking the flexible hose in out position, elastic return device (9) of the drum and its shaft of rotation (6) with respect to the box.

It should be noted furthermore that any means for attachment of the box on a support of the passenger space can be provided, temporary means (clipping, catching, screwing) or definitive means (riveting, gluing).

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Finally, the installation is foreseen to be equipped with any safety means of the fuse type as well as with all necessary accessories such as the different end pieces suitable for particular problems, flexible hose extensions for reaching the trunk of the vehicle.

The advantages emerge clearly from the description; we again stress the integration and easy manipulation of the installation in the vehicle allowing for its quick and frequent use without particular steps, in any circumstances, and this for a cost price which is very quickly absorbed.

Claims

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1. A waste vacuum cleaning installation particularly for automobiles, characterized by the fact that it essentially uses electric motor (12, 20, or 30) equipped for creating a depression in a waste vacuuming circuit which is composed of flexible hose (7) with suction end piece (8), wound on rotary drum (4, 17 or 34); said hose communicating in a sealed manner, through a central space of the drum and at least one hole or passage, with removable waste receiving tank (3, 18 or 32) capable of holding in the waste, with only the air sucked in by the motor emerging to the open air.

2. A vacuum cleaning installation according to Claim 1, characterized by the fact that waste receiving removable tank (3, 18 or 32) and drum (4, 17 or 34) for winding of the flexible hose, along with all the necessary sealing means, are housed in box (1, 16 or 38) which also has the hole or holes or passage for communication between the central space of the drum and the tank.

3. A vacuum cleaning installation according to Claim 2, characterized by the fact that electric motor (12, 20 or 30) creating the depression is housed entirely or partially in box (1, 16 or 38), or else is arranged independently of the box and connected to the tank by and appropriate duct (31).

4. A vacuum cleaning installation according to Claim 1, characterized by the fact that flexible vacuum hose (7) wound around rotary drum (4, 17 or 34) has in its thickness a metallic reinforcement keeping it from being crushed during operations.

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5. A vacuum cleaning installation according to either of Claims 1 and 4, characterized by the fact that the periphery of flexible hose (7) has regularly spaced rough parts of the groove (7a) type in order to cooperate with retractable non-return device (10) when it is unwound from the drum.

6. A vacuum cleaning installation according to Claim 2, characterized by the fact that rotary drum (4, 17 or 34), removable tank (3, 18 or 32) and box (1, 16 or 38) are established in different shapes and sizes depending on the method of attachment of the installation in the passenger space of the vehicle.

7. A vacuum cleaning installation according to Claim 2, characterized by the fact that box (1, 16 or 38) has any type of means for attachment, catching clipping, gluing... with a vertical, horizontal or inclined support of the passenger space of the vehicle, integrated or not in the construction of the vehicle.

8. A vacuum cleaning installation according to Claim 2, characterized by the fact that it is designed for being portable and independent from the vehicle, with source of power.

9. A vacuum cleaning installation according to Claims 1, 2 and 5 together, characterized by the fact that drum (4, 17 or 34) for winding of flexible hose (7) has, around its shaft (6) of rotation with respect to box (1, 16 or 38), an elastic return means for re-entry of the flexible hose after it is released from non-return device (10).

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10. A vacuum cleaning installation according to Claim 2, characterized by the fact that flexible hose (7) receives interchangeable suction end pieces (8) which have conical bearing surface (8a) in the rear for resting against a corresponding conical bore of the box, in re-entered position.

11. A vacuum cleaning installation according to Claim 10, characterized by the fact that at least one of suction end pieces (8) has mouth (8b) which is ovoid in shape with brush (8c) attached in the longitudinal axis on central partition (8d) connected to the periphery by transverse braces (8e).

12. A vacuum cleaning installation according to Claim 1, characterized by the fact that removable tank (3, 18 or 32) has waste retaining filter (13, 27 or 33) on the path of return of the sucked air to the motor.

13. A vacuum cleaning installation according to Claims 2 and 6 together, in an application according to which it is placed or attached on a horizontal surface, characterized by the fact that drum (4) is centered on hollow sleeve (2c) connected with support base (2) containing removable tank (3), and over its whole height, starting from a widened lower part interiorly forming chamber (4a) for circulation of air and waste in the direction of the drawer through openings (2b) of base (2), has helical projection (4b) intended for the winding of flexible hose (7); the pitch of the helix being calculated so that its sides are tangential with the axis of outlet of said hose.

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14. A vacuum cleaning installation according to Claim 13, characterized by the fact that in order to ensure correct winding of flexible hose (7), at least one guide roller (11) is provided, placed vertically between the helix and the box.

15. A vacuum cleaning installation according to Claims 2 and 6 together, in an application according to which it is attached on a horizontal, vertical or inclined surface and is presented in an extra-flat form, characterized by the fact that box (16) is connected with base plate (15) intended for being attached against said surface; said box being separated by

transverse partition (25) forming a compartment for removable drawer (18) and a compartment for winding drum (17), whereas, between the drum and the lower surface of the box, intermediate partition (22) delimits space (e) in which two sealed chutes (23-24) are arranged for circulation of the air; chute (23) being established so as to bring the air and waste from central cavity (17a) of the drum where the flexible hose opens, to the removable tank, this occurring through delimited space (e1) and passages (18c, 25b) of the partition and of the tank, whereas chute (24) is established so as to bring back the air sucked in from the tank, through its filter (27) and passages (18b-25a) of the partition and of the tank, to casing (28) of electric motor (20), housed in cavity (17a), and for this purpose having opening (28a).

16. A vacuum cleaning installation according to Claim 15, characterized by the fact that tank (18) is arranged in particular at the site of indentations (18b-18c), and its walls are arranged for being engaged in its compartment in two orthogonal positions depending on whether the installation is attached on a horizontal surface or a vertical surface.

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17. A vacuum cleaning installation according to Claims 2, 3 and 6 together, in an application according to which it is attached against an approximately vertical surface and is present in an extra-flat form with electric motor (30) independent from box (38), characterized by the fact that the air and waste sucked into flexible hose (7) flow into central cavity (34a) of winding drum (34) and rejoin tank (32) through sealed chute (35) arranged between intermediate partition (36), the surface for attachment of the box and delimited space (e3) communicating with the drawer.

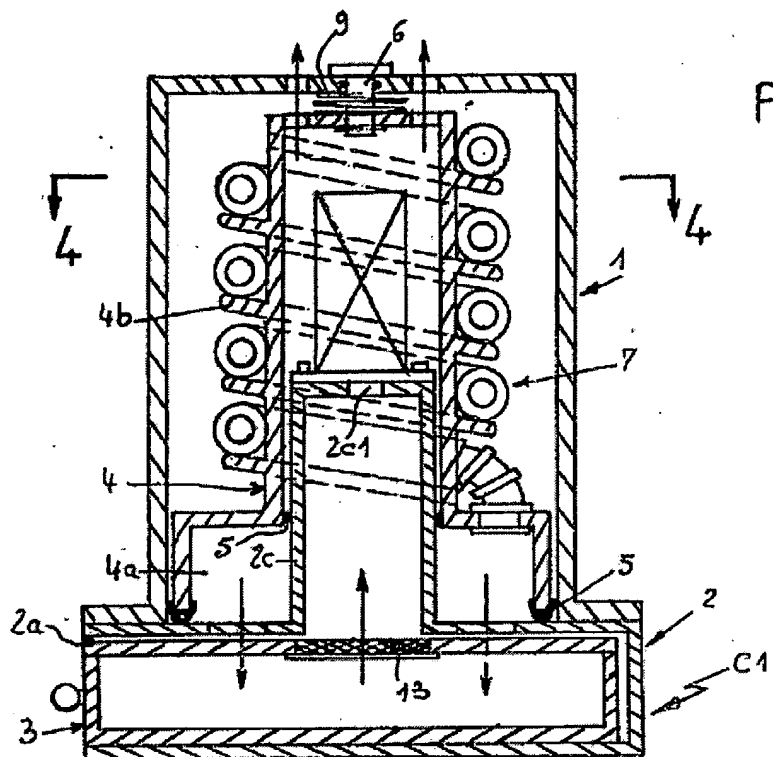


FIG. 3

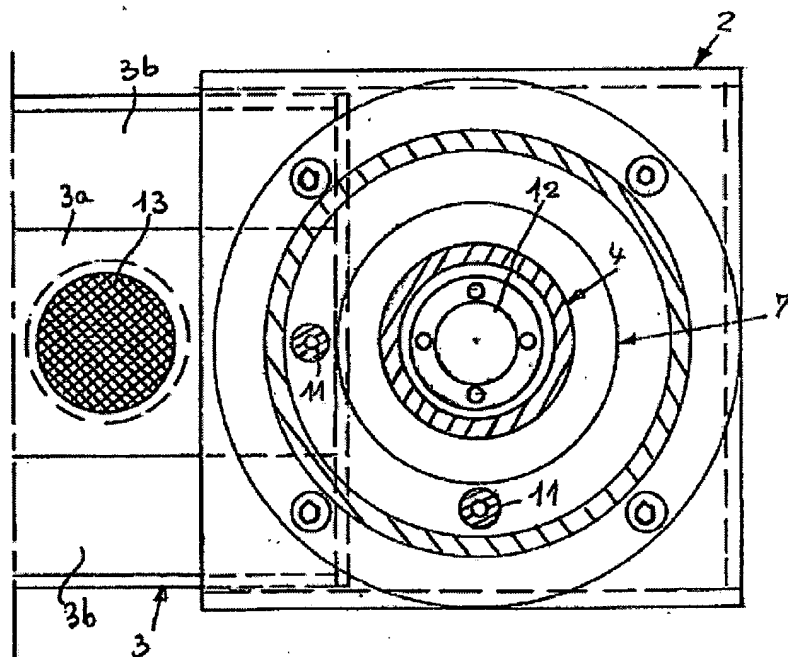
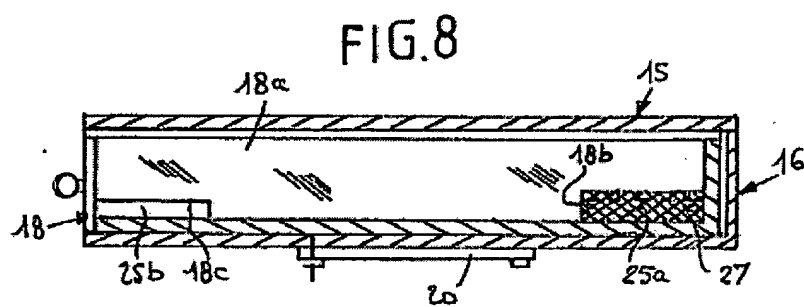
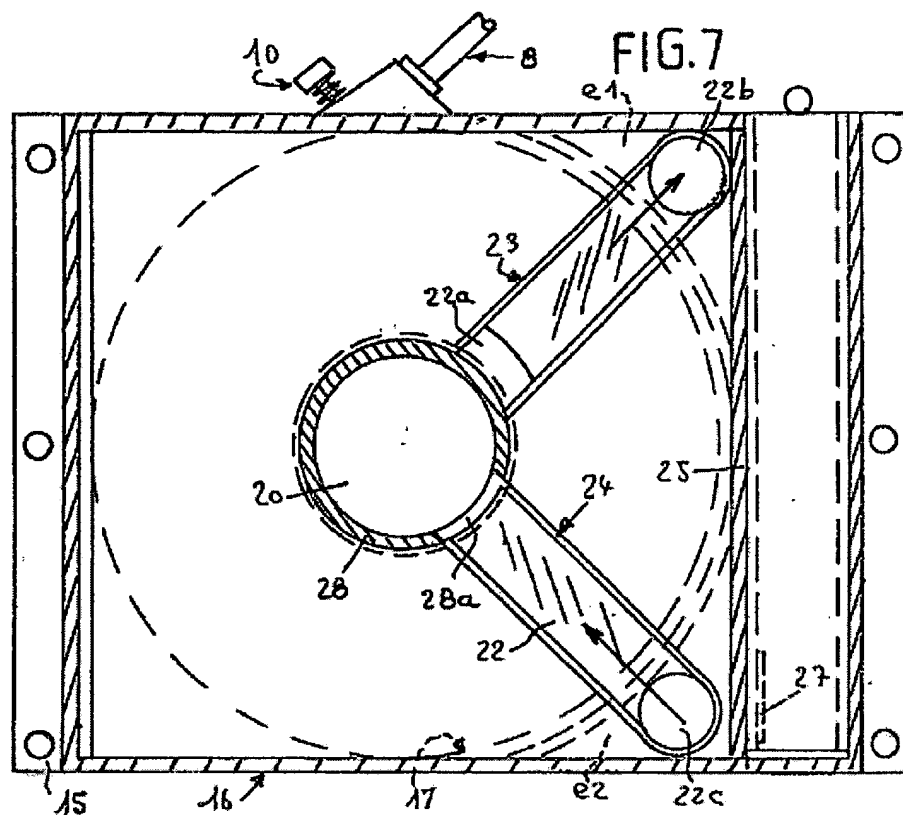


FIG. 4



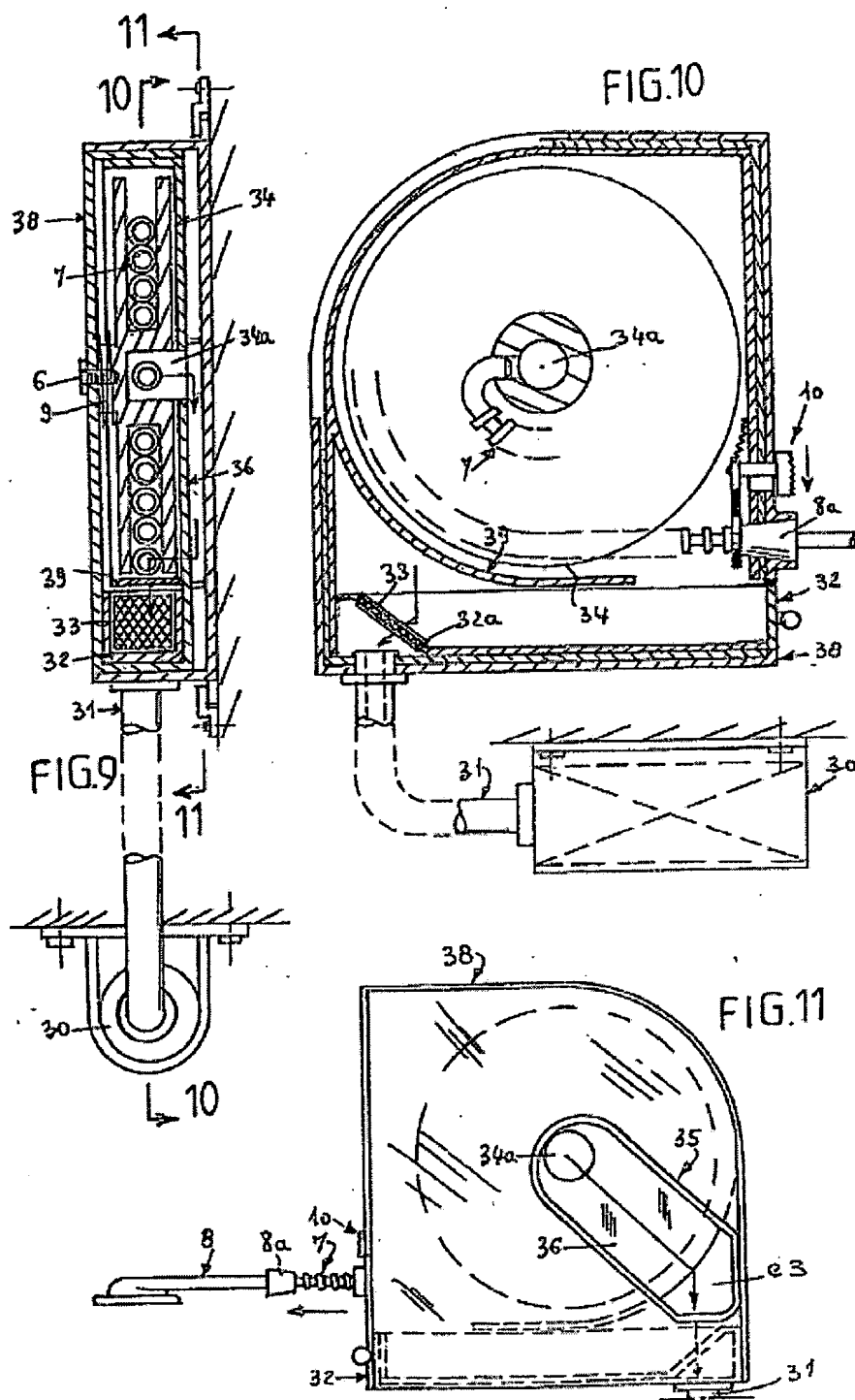


FIG.12

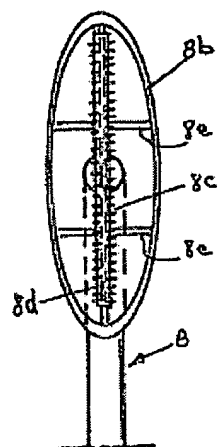


FIG.13

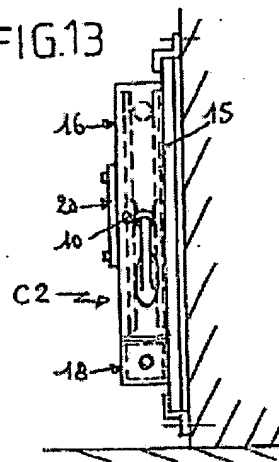


FIG.14

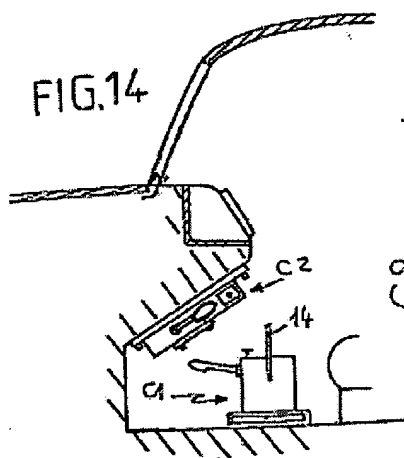
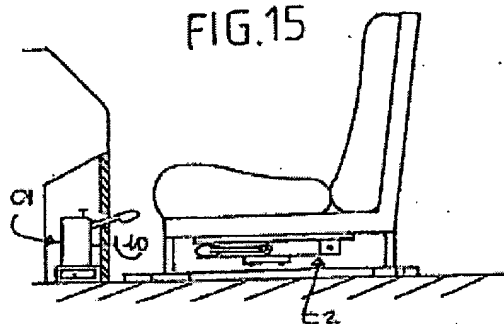


FIG.15



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication where appropriate, of relevant passages	Claims concerned in the examined document	
X A	GB-A-2 210 775 (CENTRAL AUTO-VACC LTD. * the whole document * ---	1-10 11-17	TECHNICAL FIELDS SEARCHED (Int. Cl. ⁵) A47L B60S
X A	DE-A-3 044 833 (H. WACK) * the whole document * ---	1,4 2,3,5-17	
X A	US-A-1 810 607 (J,H. IRONS) * the whole document * ---	1,8,12 2-6	
Y	DE-A-2 910 313 (D. SCHLOESSER) * the whole document * ---	1-17	
Y	WO-A-9 118 773 (CENTRAL AUTO-VACC LTD) * the whole document * ---	1-17	
A	US-A-2 718 655 (H.K. CYMARA) * the whole document * ---	2,4-6,9, 13,14	
A	GB-A-2 219 195 (MOTOVAC LTD) * the whole document * -----	1-3	
Date of completion of the search December 3, 1992		Examiner M. Vanmol	
CATEGORY OF CITED DOCUMENTS			
X: Particularly relevant if taken alone.		T: Theory or principle underlying the invention.	
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PTO 07-0602

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PN=299 21 025

VACUUM CLEANER
[Staubsauger]

Ludwig Schollmayer

UNITED STATE PATENT AND TRADEMARK OFFICE
Washington, D.C. November 2006

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APPLICANT	(71):	
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VACUUM CLEANER

/1*

Description

The innovation relates to a vacuum cleaner for cleaning and collecting dirt particles, which can be used in a mobile environment.

Ordinarily minivacuum cleaners which are supplied with current via batteries are used especially in motor vehicles and boats. To some extent these mobile minivacuum cleaners are also supplied with power with a corresponding cable or via the cigarette lighter from the battery in the car. Often the power source for these mini-vacuum cleaners is also a 220 V outlet (as special equipment in vehicles equipped with one or via a correspondingly long cable, a conventional outlet in a building).

Likewise regular home vacuum cleaners (larger vacuum cleaners) are used to clean vehicles of all types via a correspondingly long cable. Often "vacuuming" (cleaning) of the vehicle interior is also done at filling stations or in car washes using commercial vacuum cleaners permanently installed there (large, powerful vacuum cleaners).

It is common to all alternatives in current use that use is not 100% flexible or is limited in a certain respect. Thus for example the use of battery-powered vacuums is very flexible, but only possible limited in time, since the length of use is dictated by the battery capacity.

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Generally it is necessary to drive either to a filling station with a permanently installed commercial vacuum cleaner or to a location which enables connection of a home vacuum cleaner to an outlet socket.

* Number in the margin indicates pagination in the foreign text.

Of the purpose of a vacuum cleaner for cleaning the interior of a motor vehicle for example, it is often also such that besides inside, floor or total cleaning, the vacuum cleaner is only needed to clean currently dirty partial areas (also very small surfaces), for example when after a family trip crumbs lie under the child seats and should be promptly vacuumed before the crumbs are rubbed into the upholstery.

The object of the innovation is to enable completely flexible and unlimited (in time, location) use of a vacuum cleaner. In this connection the vacuum cleaner is also to be suited for cleaning partial areas (for example: only behind the front passenger's seat in a motor vehicle) as well as for comprehensive total inside cleaning for example of a motor vehicle by vacuuming the upholstery and all other surfaces.

The object is achieved as claimed in the innovation by a mini-vacuum cleaner installed permanently in the vehicle (or boat or aircraft). The permanent installation of the vacuum cleaner in the vehicle results in that the vacuum cleaner can be flexibly used without any limitation (time/ space/location). There are no location limitations since the vacuum cleaner can be used independently of outlets or other external power supply. Therefore it is not necessary to drive for example to a filling station with permanently installed commercial vacuum cleaners to clean the inside of the vehicle. Regardless of whether the vehicle is stopped or travelling, the vacuum cleaner is always handy and ready for use. There is no limit on the time of use, as in a battery-operated vacuum, since the power is supplied via the vehicle's own power source (for example, a car battery in a motor vehicle). In contrast to conventional battery-operated vacuums, this vacuum does not need to be recharged after use. The

relevant power source in this connection (car battery) charges when the engine is running on the next trip alone and thus at the same time the energy capacity which is made available to the vacuum.

In the case of a motor vehicle the normal battery capacity is sufficient for intensive cleaning of the vehicle interior. For larger vehicles (aircraft, ships or boats) the required power supply can be ensured via an adequately dimensioned battery capacity.

The permanent installation of a vacuum cleaner as claimed in the innovation (for example, in a motor vehicle) takes place by the suction part being mounted for example in the trunk. Mounting can be done directly on the side of the rear seat bench facing the trunk. The attachment of the suction part to the back wall of the seat bench can be done by screwing, tacking, cementing or other suitable processes. /4
The detailed configuration of the corresponding mounting and the ultimately chosen approach to attaching a mounting for the suction part or attachment of the suction part directly is at the discretion of one skilled in the art. The respective configuration will be oriented to the vehicle type, model of the suction part and other relevant criteria or implementation conditions.

According to different versions, the suction part is attached elsewhere in the trunk. For certain vehicle types (or aircraft or boats/ships) the mounting or attachment of the suction part in the vehicle interior or elsewhere in or on the vehicle will be done at the discretion of one skilled in the art within the framework of an advantageous configuration of the innovation.

The actual suction part with the permanently installed air intake fitting corresponds to that of a conventional vacuum cleaner. In this

connection, the size and vacuum power of the suction part depend on the size (cleaning area) of the vehicle to be cleaned (motor vehicles, boats and ships in all different versions).

Power is supplied to the suction part as claimed in the innovation via the vehicle's own power supply source (for example, the car battery in a motor vehicle). If necessary, the battery voltage is matched to the voltage required by the suction part via an adapter installed between the battery and suction part. In the off state the suction part does not use any energy or battery current. /5

The vacuum cleaner bag connected to the suction part according to one advantageous version of the innovation is attached directly to the suction part or is attached permanently connected to it in a mounting intended for this purpose. Depending on the configuration, different versions of vacuum cleaner bags can be used (interchangeable disposable bags for use in a jacketed shell; loose disposable bags; washable bags or those which can be emptied and which can be used again and again). The choice of the version is at the discretion of one skilled in the art. In one alternative embodiment of the innovation, the vacuumed dirt is collected, not in a bag or other receptacle, but is blown directly into the open via a relay line through a pipe or hose. The corresponding opening for this purpose is advantageously located on the bottom of the vehicle. But of course - this is again at the discretion of one skilled in the art - it can also be placed elsewhere on the vehicle. The material for the connection of the suction part to the aforementioned opening can be plastic, aluminum or other suitable material.

In one advantageous configuration of the innovation the suction part with a permanently connected bag is attached in the vehicle at a point on the side of the rear seat bench facing the trunk, where the center arm rest of the rear seat bench can be folded up and down. The final placement is at the discretion of one skilled in the art.

The suction part is connected to a conically running air intake fitting the rear seat bench at the aforementioned location. In the vehicle interior in this configuration of the suction part only /6 the narrowed ring of the conically running air intake fitting is apparent, and only with the rear center arm rest folded down. The opening to be seen is preferably covered in order not to impair the optical appearance of the vehicle interior. This cover is made at the discretion of one skilled in the art and/or according to the requirements for a good appearance in shape, attachment, and material. The cover can be easily removed and easily re-attached. When the cover is open, a hose with a fitted attachment is attached to the air intake fitting. Depending on the configuration, this is done by a corresponding coupling device on the hose and air intake fitting or by simply "inserting" the end of the hose in the air intake fitting. The length and diameter of the hose are dimensioned such that it works well or can be used for cleaning the relevant space or the relevant cleaning surfaces with respect to range and power.

Different "attachments" for vacuuming or collecting dirt are slipped on the front end of the hose (the end facing away from the air intake fitting in the coupled state). These attachments are shaped or configured according to technical requirements (comparable to the attachments of conventional vacuum cleaners - also minivacuum

cleaners).

The hose is removed from the air intake fitting after use, the attachments (generally the one used last) is removed or separated /7 from the hose accordingly. The individual parts are stowed in a space-saving manner in a container designed for this purpose at a suitable location (in a passenger car for example in the trunk).

One completely alternative configuration of the innovation calls for making the mounting a battery charger (similar to conventional battery-operated vacuums), the charger (here = mounting) likewise being supplied with power via the vehicle power source (for example the car battery in a passenger car).

The suction part with a permanently connected vacuum cleaner bag (capture receptacle) is removed from the mounting and used. On the air intake fitting of the suction part either a fixed nozzle (a fixed attachment) for picking up the dirt is attached or flexible, loose attachments are placed on the air intake fitting and securely joined to it by insertion, screwing or coupling.

The idea underlying the innovation is detailed in the following description using one embodiment. The two figures show one version of the innovation on the example of a passenger car.

Figure 1 shows a perspective of a passenger car viewed from the rear (from the trunk side). On the side of the rear seat bench (4) facing the trunk (10) the suction part (1) together with the vacuum cleaner bag (2) is attached in a correspondingly shaped mounting /8 (11) at one site on the rear wall of the seat bench where the rear center arm rest is folded up and down (3). The hose (6) and the different attachments (7) are stowed after use in a storage container

(5) designed for this purpose in the trunk. Power supply takes place via the power supply cable (12) which connects the suction part (1) to the car battery. As in a conventional battery-powered vacuum cleaner, the suction part is activated/deactivated via a corresponding on/off switch. This switch is a permanent component of the suction part.

Figure 2 shows a perspective view of a passenger car viewed from the front (from the interior side of the vehicle).

Towards the interior side the conical air intake fitting (8) empties from the permanently installed suction part and vacuum cleaner bag such that the narrowed side of the conical shape is accessible from the interior side at the location at which the rear center arm rest is folded up or down (rear wall of the rear center arm rest (3)). On this accessible side of the air intake fitting (8) the hose (6) is inserted fitted and airtight. Depending on the cleaning task (surface or joint) the suitable attachment (7) is slipped onto the front hose end.

In the off state of the permanently installed vacuum cleaner the opening of the air intake fitting (8) is covered in the described and illustrated embodiment.

List of reference numbers

/9

- 1 suction part
- 2 vacuum cleaner bag
- 3 rear wall of the rear center arm rest
- 4 rear seat bench
- 5 storage container
- 6 hose
- 7 attachment
- 8 air intake fitting

9 cover of air intake fitting

10 trunk

11 mounting

12 power supply cable

Claims

/10

1. Vacuum cleaner for use in a mobile environment, preferably in motor vehicles (passenger cars, trucks, trailers and recreational vehicle, busses) but also in aircraft and boats, characterized in that the suction part (1) is permanently installed.

2. Vacuum cleaner for use in a mobile environment in a configuration alternative to Claim 1, wherein the battery charging station for a mobile, battery-operated vacuum cleaner, which is used at the same time as a mounting, is permanently installed.

3. Vacuum cleaner as claimed in Claim 1, wherein power is supplied via the vehicle power source (the battery in a motor vehicle) and the power supply can be directly activated or deactivated via an on/off switch on the suction part. In alternative embodiments the on/off switch can also be mounted elsewhere.

4. Vacuum cleaner as claimed in Claims 1 and 2, wherein it can be used independently of an external power source.

5. Vacuum cleaner as claimed in Claims 1, 3 and 4, wherein in a motor vehicle the vacuum cleaner (1) is permanently attached in the trunk (10). The attachment takes place by a mounting (11) made for this purpose or by screwing, clamping, tacking or cementing the suction part (1) directly on the vehicle. In the case of the mounting (11) it is preferably metal or plastic.

6. Vacuum cleaner as claimed in Claims 1, 3, 4, and 5, wherein the capture receptacle for the vacuumed dirt is equipped with interchangeable, easily cleaned or disposable vacuum cleaner bags (2).

7. Vacuum cleaner as claimed in Claims 1, 3, 4, and 5, in an alternative configuration to Claim 6, wherein the vacuumed dirt is blown directly into the open underneath the vehicle through a hose or pipe via corresponding relay line.

8. Vacuum cleaner as claimed in Claims 1, 3, 4, 5, 6 and 7, /11 wherein the suction part (1) with the air intake fitting (8) is attached to the rear wall of the rear center arm rest (3).

9. Vacuum cleaner as claimed in Claims 1, 3, 4, 5, 6, 7 and 8, wherein the air intake fitting (8) is made as a coupling device for a hose (6) and it can be coupled by turning or screwing it in or by insertion. The hose consists preferably of plastic.

10. Vacuum cleaner as claimed in Claims 1, 3, 4, 5, 6, 7, 8 and 9, wherein the hose (6) is made such that different attachments (7) for picking up dirt can be placed on the end facing away from the air intake fitting (8).

11. Vacuum cleaner as claimed in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10, wherein the accessory parts to be coupled to the air intake fitting (8), such as the hose (6) and various attachments (7) are stowed in a space-saving, permanently installed storage container (5) designed for this purpose in the vehicle, preferably in the trunk (10).

12. Vacuum cleaner as claimed in Claims 2, 4, and 6, wherein power supply of the battery charging station/battery charging mounting takes place via the vehicle power source (the battery in a motor vehicle) and the vacuum cleaner after removal from this mounting - charged with

energy - can be flexibly used independently of the mounting for active vacuum use.

FIG. 1

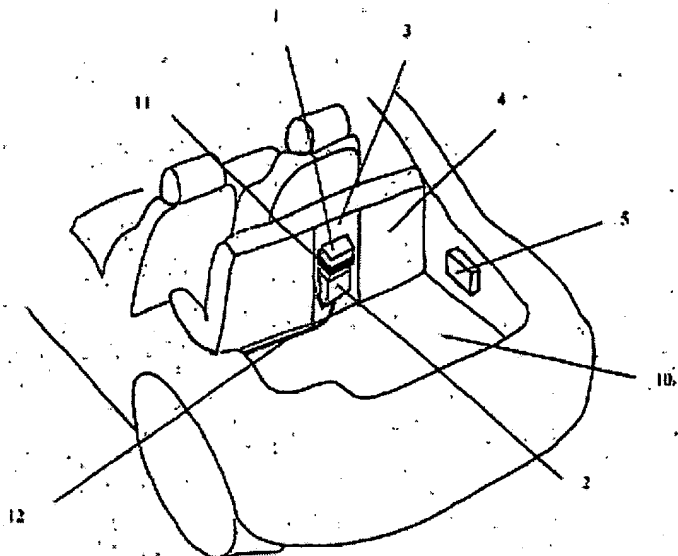


FIG. 2

